JCL Skeletons

This section provides the following information:

- JCL Skeleton Details
- Changing JCL Skeletons
- Creating User Parameters and Skeletons

JCL Skeleton Details

The following topics are covered below:

- Formal Parameters in JCL Lines
- INCLUDE
- Properties of Datasets
- Special Parameters
- Conditional Selection of JCL Steps and Lines
- Elementary Conditions
- Complex Conditions

Formal Parameters in JCL Lines

This section describes all formal parameters which can be used in JCL lines.

Those formal parameters are denoted by two "#"-signs. The first character denotes the type of the parameter.

The skeletons contain JCL text mixed with formal parameters. These formal parameters are replaced during JCL generation with current values.

The following formal parameters are provided:

Formal Parameter	Description
#V-<name>#	These are the environmental parameters. Refer to report "Parameters" for a list of all parameter names.
#G-<name>#	These are the global parameters. Supply values to these parameters using "Global Parameters", in the "Administration" menu.
#I-.....#	Include another selection. See below.
#D-.....#	Properties of datasets, like name on tape and disk, etc. See the following list of options.
#P-.....#	SMA-internal parameters. These parameters **must not** be changed.
#S-.....#	Special parameters. See the list of options that follow.
#T-nnn#	T- followed by a number sets the "print position" where the next character is to be placed in the line. This feature is needed, if characters following other parameters are to appear on fixed positions.

INCLUDE

Format-1: #i-<skeleton-name>#
Format-2: #i-p-<PIPARM-name>#

This statement can be used within a skeleton. It must be placed at the beginning of a line. It causes (Format-1) to include the named skeleton at this point in the "calling" skeleton.

Such includes may be nested; i.e., the named skeleton might in turn contain a #I-...#.

The skeleton name may include a product name, with &&& instead of the version number. The &&& is replaced by the installed version of this product.
This feature is used for the Natural link, for example:

```
#I-INCL-NAF&&&#: if 234 is the version of NAF which is to be installed or is
installed, then skeleton INCL-NAF234 will be included at this point.
```

In format-2 the Include statement contains the name of an SMA-internal parameter. In this case the value of this parameter is first evaluated, and then this value is taken as the name of the skeleton to be included.

Properties of Datasets

Format: #d-<attrib>(<dataset>)#

The D-... parameters reference certain attributes of datasets. Two specifications are needed within these parameters; what attribute for which dataset.
The following constant texts are possible values for the <attrib> part of these parameters:

Constant Text	Description
DSN-D	Dataset name on disk (if on disk)
DSN-T	Dataset name on tape
VOL-D	Volser of the disk the dataset is on
VOL-T	Volser of the tape the dataset is on
LBL	Label number on the tape
LBL3	(Label number 1) * 3 (for VSE/SP)
N-BLK	Number of blocks
RECFM	Record format
BLKSZ	Block size
LRECL	Record length
DSORG	Dataset organization (see below)
D-BLK	Number of Directory blocks (if it is a library)
D-T-C	Date and Time of Creation
DEV	Device type of the disk, if on disk; or of the tape, if not on disk
SPACE	Text of the space allocation parameter

There are the following options for the <dataset> - part:

- Symbolic dataset name (e.g., NAT234.LOAD)
- Symbolic dataset name, with &&& instead of the version number.
  This denotes the installed version of the respective product.
- SMA internal parameter (e.g., P-DSN)

Examples for the use of these features are:

```
Library-Names in Link-edit steps:
  //... DD DSN=#D-DSN-D(NAT&&&.LOAD)#,DISP=SHR
  //... DD DSN=#D-DSN-D(CNT&&&.LOAD)#,DISP=SHR

General Copy-Skeleton Tape to Disk:
  //SYSUT1 DD DSN=#D-DSN-T(P-DSN)#,DISP=(OLD,PASS),
  //           VOL=SER=#D-VOL-T(P-DSN)#, ....
```


Special Parameters

 # S-<keyword>#

This is a sequence of special parameters with fixed meaning:

Special Parameter	Description
S-JOB	Job ID from the PIN entry
S-DESC	Job description for this Job-ID
S-DATE	Date of job generation
S-TIME	Time of job generation
S-SEQ	Sequence number of the step
S-FNAT	FNAT for current SMA dialog
S-FUSER	FUSER for current SMA dialog
S-FDIC	FDIC for current SMA dialog
S-FSPOOL	FSPOOL for current SMA job generation
S-ENVIRON	Environment name, where JCL is currently being generated.
S-SMALIB	Library of SMA itself
S-DBID	DBID for current SMA dialog
S-SMA-LFILE	LFILE specification for SMA data.
S-REP	Index value of repetition factor.
S-REPZ	Like S-REP, but with one leading zero.
S-PROD	Name of the product, where this step belongs to.
S-PRODNAM	First three (3) characters of S-PROD
S-PRODVER	Last three (3) characters of S-PROD
S-PINISN	ISN of the control record of this step
S-IGCNUM	Computes number for the IGC-name in the SVC-install for MVS. Input is from #V-SVC#.
S-TRK (<Cylinder>,<Unit>)	<Cylinder> and <Unit> are Prod-Parameters (but without "v-"). The whole expression delivers the number of tracks for the given number of cylinders on the given device.

Conditional Selection of JCL Steps and Lines

The generation of a JCL line can be made dependent on the evaluation of simple or complex conditions. These conditions can be modified after using PF11 during edit of the JCL skeleton.

Elementary Conditions

The elements which can be used in these conditions are:

Element	Description
BATCH	Use this JCL line only when writing the generated JCL to a work file (this is only in batch). The statements used to separate the work file should be marked with this condition.
ONLINE	Use this JCL line only when writing the JCL to the SMA database.
TAPE	Use this JCL line only when the dataset which was last used in a #D-...# parameter does not reside on disk. Through this condition SMA can adapt generated JCL to datasets being on tape or disk.
DISK	Analogous to TAPE.
SECU	Use this line only, if Natural Security is already installed.
<pppnnn>	Use this line only if the product pppnnn is installed or marked to be installed. The version numbers in the product names can be left out (e.g., ADA623, ADA6 or ADA are all acceptable).
=<pppnnn>	Use this line only if the product pppnnn is marked as to be installed or is installed, **but** do not use it, if it is installed and another version of the same product is "to be installed".
><pppnnn>	Example: >NAT23. Use this line only if the product pppnnn or a higher version is marked as to be installed or is installed, **but** do not use it, if it is installed and a lower version of the same product is "to be installed".
<<pppnnn>	Example: <NAT23. Use this line only if the product pppnnn or a lower version is marked as to be installed or is installed, **but** do not use it, if it is installed and a higher version of the same product is "to be installed".
$<pppnnn>	Use this line only if the product pppnnn is marked as to be installed and is **not** installed before this.
#<parm>	The parameter with the given name is searched in the current environment. If it has a current value different from NO, N or blank, the JCL line is selected.

Complex Conditions

Product and variable names can be combined to complex conditions using opening and closing brackets, and the operators:

+	Or:	Use the JCL line if at least one of the "or-" conditions are true.
*	And:	Use the JCL line if all "and-" conditions are true.
^	Not:	Use the JCL line, if the condition is not true.

The rules for combining the elementary conditions using these operators follow the usual conventions. No blanks are allowed within the condition. Maximum nesting of expressions is 6.

Examples of legal expressions are:

```
^CNT              Use this line if CNT is not installed

NAF*PCM*AOS       Use this line if NAF, PCM, and AOS are all installed

PCA+NDM+(^CNT     Use this line if either PCA or NDM is installed,
                  but not CNT.
```


Changing JCL Skeletons

Skeletons may be modified or replaced by the user or by Software AG. A skeleton will be replaced by Software AG when the tables on a new product tape contain a revised version of an existing skeleton. This may be necessary due to new requirements for new products.

The LOAD program will replace skeletons in the default environment, but will not replace skeletons which have been modified by the user, in a user environment. In both cases, the user will be informed by a warning message.

To avoid conflicts, the user should change only the skeletons which will not be changed by Software AG. These skeletons are described in the following sections:

- Job Card
- Adabas Files
- COPY Steps
- Skeleton SMA-COMMIT
- Skeleton ZAP-COMMIT
- Natural Parameter Modules
- INCLUDEs for Linking Natural

Job Card

Operating System	Skeleton Name
OS/MVS	JOB-CARD
VSE/SP	JOB-INIT
BS2000	not used

Adabas Files

Operating System	Skeleton Name
OS/MVS	ADA-FILES
VSE/SP	ADAFILES
BS2000	not used

For OS/MVS:

This skeleton contains the DD-statements for the files of the Adabas databases. SMA assumes the following naming convention for these datasets:

<common-prefix>.ASSOR1
<common-prefix>.DATAR1
<common-prefix>.WORKR1
<common-prefix>.SORTR1
<common-prefix>.TEMPR1

This skeleton may be modified if the user wishes to apply a different naming schema.

For VSE/SP:

This skeleton contains a PROC definition including all ASSGN, DLBL, and EXTENT statements needed for the files of the Adabas database. This PROC will be used in many installation jobs. If the user's requirements differ from the assumptions made by SMA, the definition of the PROC must be changed.

COPY Steps

The skeletons named COPY-... are used when copying from tape to disk. Special tape handling procedures can be included here. The following copy skeletons are available:

Skeleton	Operating System	Description
COPY-PS	OS/MVS only	Copy a sequential dataset
COPY-PO	OS/MVS only	Copy a library
COPY-PS-SUB	VSE/SP only	Copy a library with sublibraries for core, relo, and source member
COPY-SAM	BS2000 only	Copy an SAM file
COPY-PAM	BS2000 only	Read a file from tape, and create a library or a program (PAM files) on disk
COPY-LMS	BS2000 only	Read a file from tape (LMS input stream) and create a library on disk

Skeleton SMA-COMMIT

The final installation step, which informs SMA that all jobs have been completed successfully, runs in an existing Natural environment and not necessarily in an environment created by SMA. Therefore, it is normally necessary to adapt this skeleton to the existing environment. Ensure that "Global Parameters" (see Global Parameters in section Menus and Line Commands) are used in these skeletons.

Skeleton ZAP-COMMIT

The skeleton ZAP-COMMIT needs to be modified to the existing environment. This skeleton is used to generate the last step in the jobs which apply or "undo" ZAPs. Modify this skeleton in your default environment (OS/MVS, VSE/SP or BS2000). Ensure that "Global Parameters" (see Global Parameters in section Menus and Line Commands) are used in these skeletons.

Natural Parameter Modules

A number of values in the generated Natural parameter modules can be set in the "Modify Environment" part of SMA. These are, in particular, the file numbers and the different "sizes". Some other parameters are generated with fixed values.

The user can set parameters in the skeletons NAT-USER-PARM-BATCH, NAT-USER-PARM-CICS, etc. These skeletons will not be replaced by Software AG with later product deliveries (whereas skeleton NATPARM could be changed by Software AG for new products).

The skeleton NAT-USER-NTSYS contains example NTSYS definitions. These definitions may be adapted by the user.

If the user wants to add members in the CSTATIC list of the Natural parameter module, they must be entered in the skeleton NAT-USER-CSTATIC-TSO, or NAT-USER-CSTATIC-BAT, etc.

The following shows how these various skeletons work together to form the Natural parameter modules for batch or online:

Skeleton NATPARM:

```
TITLE 'NATURAL PARAMETER MODULE'          Start of NTPRM
NTPRM
  .
  .                                       Software AG-owned NTPRM-parameters
  .
  .
CSTATIC=(...
  .
  .                                       Software AG owned CSTATIC-lines
  .
include skeleton NAT-USER-CSTATIC         User-owned CSTATIC-lines
  ...),
  .
  .
  .
include skeleton NAT-USER-PARM...         User-owned NTPRM-parameters
  .
  .
  .                                       Last line of NTPRM
include skeleton NAT-USER-NTSYS           User-owned NTSYS-spcecifications
  .
  .
  .
  .                                       Software AG owned NTFILE- and NTDB-
lines
  .
  .
  .
END                                       End of source module
```

INCLUDEs for Linking Natural

The INCLUDE structure of Natural depends on the combination of products to be installed; this is considered by SMA.

If the user wants to add his/her own modules, he/she may enter the appropriate INCLUDE lines in the skeleton NAT-USER-INCLUDE, and if necessary, he/she may enter DD statements for additional libraries in the skeleton NAT-USER-OWN-LIBS.

Creating User Parameters and Skeletons

When SMA is used intensively, it may be desirable to introduce specific parameters or skeletons.

To introduce specific parameters or skeletons

1. Create a work file (a member) containing input in SMA LOAD format, defining the new parameters and skeletons.
   This file must consist of 80 byte records, and can be created using any standard source editor.
   The last record must be a comment line.
2. Run the SMA LOAD Utility, using the file created in Step 1 as work file 1.

Comments

Comment Lines:

##***	Commentary, no data in SMA loaded. Use frequently, for better readability of the table input members.

JCL Skeletons

The lines following the ##JCL line, until the next ## line, form the JCL skeleton.

##JCL, <function>, <environment>, <change-allowed>, <version>, <text>

Parameter	Description
<function>	Name of the JCL skeleton, as used in #i-... # . Maximum name length is 18 characters.
<environment>	Name of the default operating system.
<change-allowed>	Always "Y".
<version>	A version date of this skeleton, as a 8 digit number in the form yyyymmdd, is optional. If a version is present, the loader will load the skeleton only if it is newer than the existing one.
<text>	Explanatory text for the skeleton. Maximum length is 72 characters.

The name of the skeleton should always start with "CUSTOMER-...", in order to avoid conflicts with Software AG’s supplied skeletons.

Environmental Parameters

The definition of a environmental parameter is done in two to six lines. The first line contains the values specified below, the second line contains possible values for this parameter, separated by a comma. The following four lines are stored as explanatory text for this parameter.

The loader takes the first of the possible values and includes it as a default value in the all environment, where thus far no value existed. If a value exists for this parameter, then this value remains unchanged.

##PRPARM, <operating-system>, <parameter-group>, <parameter-name>, <change-allowed>, <Alpha or Numeric>, <Min.Value>, <Max.Value>

If the parameter has the type A (Alpha), then <Min.Value> and <Max.Value> denote the minimum and maximum lengths.

The parameter group should always be "CUSTOM", and the parameter name should always start with "CUSTOMER-..." in order to avoid conflicts with Software AG's supplied parameters.

Parameters introduced by customers in this way, can be used in any skeleton.

Example

The following is a full example how this can be used in OS/MVS:

1. Define Paramter CUSTOMER-DEPT and Skeleton CUSTOMER-JC
   Create the input file for SMA LOAD using a normal source editor:

```
##PRPARM,OS/MVS,CUSTOM,CUSTOMER-DEPT,Y,A,1,32
F-OD
DEPARTMENT OF DATA CENTER OWNING THIS SMA ENVIRONMENT
##JCL,CUSTOMER-JC,OS/MVS,Y,,ADDITIONAL JOB-CARD LINES
//* ------------------------------------------------
//* SOFTWARE AG INSTALLATION JOB.
//* OWNER: #V-CUSTOMER-DEPT#
//* ------------------------------------------------
##*** COMMENT LINE: MUST BE THE LAST LINE
```

2. Load the definition created in Step 1 into an SMA file
3. Use the definition in an existing skeleton JOB-CARD:
   Add a line #I-CUSTOMER-JC# at the end of the skeleton.

The JCL generator will extend the job cards using the skeleton CUSTOMER-JC in all subsequent generations.

